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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/749,643

12/31/2003

Himanshu Pokhama

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9394

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7590

03/15/2005

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EXAMINER

CHERVINSKY, BORIS LEO

ART UNIT

PAPER NUMBER

2835

DATE MAILED: 03/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/749,643

Applicant(s)

POKHARNA ET AL.

Examiner

Boris L. Chervinsky

Art Unit

2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1, 5, 14, 23, 24, 28, 29, 51, 53, 55, 56 are rejected under 35

U.S.C. 102(a) as being anticipated by Nelson et al.

Nelson discloses a system comprising an integrated circuit (IC) die 105; a folded fin microchannel heat exchanger 120 operatively and thermally coupled to the IC die 105, the folded fin microchannel heat exchanger comprising: a thermal mass having a cavity; a folded fin 660C located within the cavity and welded to the metal portion of the cavity, the folded fin 660C defining, at least in part, a plurality of microchannels 600C within the cavity; and an inlet and an outlet 130A, 130B, wherein the microchannels are fluidly coupled at one end to the inlet and at the other end to the outlet; a pump 340, having an inlet and an outlet fluidly coupled to the inlet of the folded fin microchannel heat exchanger 120, and a heat rejecter 150, having an inlet fluidly coupled to the outlet of the folded fin microchannel heat exchanger and an outlet fluidly coupled to the inlet of the pump, wherein the system employs a working fluid that transfers heat generated by the IC die to the heat rejecter using a two-phase heat exchange mechanism; the working fluid is water. The method steps of claims 51, 53, 55 and 56 are necessitated by the device structure as disclosed by Nelson et al.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-4, 11, 33, 42, 52, 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al.

Nelson discloses the claimed invention, as shown above, except aluminum or copper, and except specific use in an antenna that is coupled to a network interface. The aluminum or copper are commonly used for heat dissipating fins as good thermal conductivity materials. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use aluminum or copper, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the claimed cooling structure for a microprocessor, for an antenna or another heat generating device that needs to be cooled, since it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

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5. Claims 6-8, 10, 15-17, 19, 25, 26, 30, 31, 35, 36, 38, 43-45, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. in view of Dove et al. Nelson discloses the claimed invention, as shown above, except solderable layer made of specific materials such as copper, gold etc. Dove discloses the solder paste disposed on the IC die for attaching the IC die to the heat-dissipating device and use the suitable materials for the solderable layer as to provide sufficient thermal conduction. The solderable layer considered as a thermal interface material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the solderable layer as disclosed by Dove et al. in the structure disclosed by Nelson et al. and to use claimed materials since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

6. Claims 27, 32, 54 rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. in view of Kenny, Jr. et al.

Nelson discloses the claimed invention except electro-osmotic pump. Kenny, Jr. discloses the cooling system that employs the electro-osmotic pump. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the electro-osmotic pump as disclosed by Kenny, Jr. et al. since the device disclosed by Nelson may use any suitable pump required for sufficient cooling (col. 5, lines 56-58).

7. Claims 9, 18, 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. in view of Kobayashi et al.

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Nelson discloses the claimed invention except a thermal adhesive. Kobayashi discloses the thermal mass 38 coupled to the IC package 22 by the thermal adhesive 36. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use thermal adhesive as disclosed by Kobayashi in the device disclosed by Nelson for optimum heat transfer.

8. Claims 11-13, 20-22, 39-41, 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. in view of Dibene, II et al.

Nelson discloses the claimed invention, as shown above, except flip-bonded chip and fasteners with the standoffs. Dibene discloses the flip-bonded chip and fasteners structure with the standoffs to couple the thermal mass and IC die to the substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the fastener as disclosed by Dibene for the device disclosed by Nelson for reliable attachment the thermal mass and the IC die to the substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Boris L. Chervinsky whose telephone number is 571-272-2039. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on 571-272-2800 ext. 35. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

BORIS CHERVINSKY
PRIMARY EXAMINER

Boris I. Chervinsky
3/9/5